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ABSTRACT

College IV is a four-year, undergraduate, liberal arts, state supported college which does not possess a schedule of classes, a time base, a grading system, or a course structure. Utilizing a curriculum matrix of auto-instructional learning packages called modules, College IV is entirely self-paced. The curriculum is all "on-line," and students may enter the college at any time throughout the year. Modules are used largely for the Freshman-Sophomore materials, and contract study for the junior-senior years. College IV extends into the community through programs in the county jail, and through a module mobile which carries curriculum to off-campus sites. The major short range problem is student motivation, and one significant challenge is developing a model to determine the "value-added" for nontraditional students. New arrangements for faculty appointment, productivity, and accountability are being explored. (Author)

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COLLEGE IV: INDIVIDUALIZED INSTRUCTION FOR AN ENTIRE COLLEGE

By Robert J. Toft

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This is a preprint of a paper which will appear in 1975 as part of the proceedings of the Second National Conference on Research and Technology in College and University Teaching held November 14-16, 1974 at Georgia State University in Atlanta, Georgia

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Audio-Visual Features

The talk will be illustrated with 2 x 2 color slides and will require a carousel projector. The slides are used to demonstrate the various principles involved in the construction of the integrated hierarchy of modules, and to show various features of the operation of the college, including the module mobile. There will be approximately 25 slides.

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College IV is a four-year undergraduate liberal arts state-supported college in Michigan. Among those things which it does not possess are a schedule of classes, a time base, a grading system and a course structure. Utilizing a curriculum matrix of several thousand auto-instructional learning packages called modules, College IV has adopted a totally self-paced system. Each module is equivalent to roughly one-tenth of a standard course in terms of content. Each module carries its own credit and is not tied to others except for pre-requisite skills. No grading system is employed since mastery learning at the ninety percent level is required for all work.

The curriculum matrix of modules represents approximately one-half of the work which a student will pursue in the course of his baccalaureate study. The other half of his work will be through contract study, either in independent mode or as small group problem-centered projects.

Since all of the modules are "on line" all of the time, students may enter College IV at any time during the year. They may start their work at any point in the curriculum matrix. This mode of operation is particularly advantageous to those who wish to pursue their education on a part-time basis.

For those who are seeking a baccalaureate degree a minimal set of distribution requirements has been established to insure some breadth of study. In addition, degree candidates must choose an area of concentration and accumulate roughly one-fourth of their total required credits in that area. Those who are not

seeking a degree may choose anything in the curriculum matrix and specialize as narrowly as they please.

The curriculum matrix is essentially an integrated hierarchy comprising all of the major disciplines. The individual learning modules are designed to be as free as possible from prerequisite modules. However, where prerequisites are necessary they are clearly spelled out, and mastery of their content must be demonstrated before the student attempts the given module. It is clear that in some disciplines - mathematics, for example - the materials are written with a greater dependence upon prerequisite knowledge. In other areas, such as American literature, the hierarchy of individual modules is less important.

In the construction of the integrated hierarchy the tendency of faculty will be to order the modules in their discipline, leaving relatively little flexibility for the student beginning that study. The role of the dean or the curriculum committee must be that of bringing pressure to bear for the dissolution of these hierarchical bonds wherever possible. To be most useful to the student the matrix should have as many entry points as is possible.

The development of the matrix and its hierarchy has the effect of showing to the faculty the essential redundance of information across discipline lines. A cursory examination of objectives for modules between chemistry and physics and biology quickly shows up areas where common material is being taught. When this occurs, a single module can be referenced by each of the disciplines. Another by-product of this cooperative effort in constructing the curriculum matrix is the development of special hybrid modules overlapping two or more disciplines. This is where the essential excitement of this format comes to life.

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New possibilities for modules are constantly being found at the borders between given sets of different disciplines.

Because students and faculty both still feel the need for group interaction, the curriculum matrix of modules is designed so that approximately one-fifth of the modules are not auto-instructional. The modules in this twenty percent are designed to be administered in the form of seminars lasting approximately three hours. So as a student is studying an area, perhaps sociology, he would look ahead and note that the next module to be taken is one concentrating on some issue which will be discussed in a seminar format. He then checks out the materials for the module, does his preparation, and signs his name to a list. When four or five students have signed this list, the instructor then schedules a seminar for a morning, afternoon or evening, at the convenience of the majority of the group. During this seminar the instructor has an opportunity to serve as an expert in his discipline and to lead the discussion into fruitful pathways. The students are expected to participate in the discussion, and their contributions are noted by the instructor and are used as the basis for assigning mastery to the topic. Failing to participate or to give significant information, they are asked to repeat the seminar with another group.

Each of the learning modules is constructed using a carefully written educational objective which states the performance to be tested after study of the module. This is followed by a rationale for the module and a list of learning activities, each accompanied by one or more enabling objectives. The student is led through the material in complete form within the module, or referenced to library materials. Following each enabling objective a short quiz is administered by the student to test his or her understanding of that part of the module. A larger self-test

for mastery is at the end of the module. When the student is confident that he has mastered the material, he then comes to the faculty-student interaction area and takes the mastery exam.

Mastery exams come in several forms and are administered and graded only by the instructors. They are graded immediately following their completion, and if mastery is not achieved, a diagnostic session with the student sends him back for further study with rather specific guidelines.

Extensive use is made of the various media for the presentation of the material in the module. In contrast to some modules of courses now available in which all of the senses are to be stimulated in each module, it is the College IV approach that media should be used to enhance the material to be learned. In some cases the written word is sufficient. In other cases, an audio tape is clearly called for. Visuals are used wherever appropriate, and motion through movies or video-tapes is supplied where necessary.

One of the guiding principles in the development of College IV has been the flexibility of this system. Part of that flexibility is involved in the portability of the modules themselves. As an experiment, we have settled upon two basic modes for presenting the information and are testing those simultaneously. Obviously, the written page is the primary form of the module. These modules are sold in our bookstore. The second form will be super eight millimeter film and an audio cassette. With a small modified projector we are able to put both text and still frame photographs, as well as motion, on one film. We intend to compare these two modes of presentation of modules for flexibility, cost, and user acceptance.

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Contract study will comprise nearly one-half of the effort of College IV students as they work toward their baccalaureate degree. The two primary modes for contract study are independent study and small group problem-centered projects. An individual student or a small group of students will develop an idea, contact a faculty member, and write a prospectus for a study project. This may be a library project, something to be done in the laboratory, an off-campus field project, or any other form of independent study. The prospectus will outline clearly the objectives toward which the project aims, the rationale and plan of attack, and a series of checkpoints to determine the progress of the project. When this plan has been approved by the faculty member, a contract will be written for a certain number of credits. The student or group of students is then obligated to carry out the study under the direction of the faculty member. Modifications in the plan are expected in studies where a complex framework has been established. When the project is completed, the final product, whether a paper, a report, or a survey, will be presented and used as the basis for awarding credit. In the case of group projects the joint report of the group will serve as one part of this determination. If that report is successful, then each member of the team will be examined orally to determine his or her understanding and contribution to the project. Failing to demonstrate satisfactory understanding, the student would be sent back to study the mechanics of the work completed, and to stand once again for examination. Only when the project has been properly completed will any credit be awarded. Therefore, no partial credit or "incomplete" is possible.

The use of modules as the medium for learning is heaviest during the first year of study and declines progressively throughout the course of study toward the

baccalaureate. Conversely, the contract study, although beginning on a small scale during the first year, increases in importance throughout the stay in College IV and becomes the primary mode of learning by the senior year. When students are given introductory learning modules, they become familiar with the format and comfortable with the clear statement of objectives. Furthermore, they come to appreciate the value of task completion. It is then that they should begin their contract study. In this way they gain experience and confidence in setting their own objectives and working towards their completion. Furthermore, students are developing those tools of analysis and synthesis which will make them productive members of the society once their formal education is reduced in scope. The twin activities of task analysis and task completion are important aspects of the system employed in College IV.

Although many courses and modules are being used widely at all levels of higher education, the framework in which one finds them has most often led to frustration on the part of both students and faculty. The restrictions of a term or semester, the necessity of employing a graded system, and the inflexibility of the traditional course structure have placed nearly insurmountable barriers in the way of this form of instruction. We believe that all of these barriers can be removed, and with careful management, the students can enjoy a freedom of choice and access heretofore impossible. Since College IV is the newest in a cluster of colleges on a single campus, we have an opportunity to test our system within a larger conventional framework. The other three colleges in the cluster all have a time frame, a course structure, and a graded system. Through the use of a computer we are interfacing successfully with them so that our students may win credit in the other colleges and may transfer our credits to the other colleges.

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One of the major byproducts of this pedagogical system is that it is basically portable. During our first year of operation we have been able to move off the campus with the college. Our first venture was to start a program in the county jail for inmates. With the help of the rehabilitation staff, approximately twenty five different inmates have been earning college credit while they serve their sentences. Several have come to the campus to continue their work full time after their release from the jail. In a second venture we have moved into a large manufacturing plant where a faculty member visits the plant one half day each week. Of the sixty persons who came to the first orientation session, more than twenty five have completed application forms for College IV and are studying. The faculty member carries modules and exams to the plant, which furnishes him with an office. The workers come in during lunch hours, breaks, and between shifts. A third project involves high school seniors in a high school within commuting distance of the college. These students, who have completed the majority of their requirements for their high school diploma, but are remaining in school, will be earning College IV credits while finishing their high school requirements. Selected high school faculty serve as adjunct tutors for the college in giving instruction and administering mastery exams. The students are able to have a head start on their college education by the time they graduate. The faculty are paid a fixed fee for each half credit module they generate. They become potent recruiters for the college.

Each of these forays into the community have developed two or three inquiries of an equally unorthodox nature. In order to cope with these, we have purchased and are equipping a module mobile. This fifth wheel van will travel from site to site on a regular fixed schedule. It will be a portable classroom for ap-

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proximately a dozen students and will carry our entire curriculum, including all multi-media and accessories. We plan to visit high schools, libraries, shopping malls, industries, jails, hospitals and nursing homes. A faculty member is being hired to drive the module mobile and to dispense information, mastery tests and goodwill about College IV.

In order to encourage those who are working on a tight budget, we have been able to break the unit cost to approximately six dollars and fifty cents per half-credit module. In addition, students may pay tuition in any amount and it may be charged against BankAmericard or Master Charge.

To keep us honest and accountable, we have an aggressive group from the University of Michigan called Formative Evaluation Research Associates. They have worked closely with the faculty and with the students this year to assess our problems and to set our goals. As you might expect, our primary problem has been student motivation, or lack thereof. Students coming from high school are unprepared for the freedom which College IV allows. Initially, we were unprepared to motivate them sufficiently, to keep them moving. It has been our position that College IV should be supportive but not coercive in working with its students. The evaluation team, the college counseling center, and our own orientation advisor have worked hard to develop an orientation process which enables students to get a better grasp of College IV initially and to set some realistic short term goals.

Administratively, our greatest challenge is the development of an accountability model which takes into consideration what I call "academic value added." We must find a quality measure to describe the additional effort required to move students

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from a normally distributed grade curve to essentially all 'A' level work. We must find a factor for figuring the value to a fireman of being able to attend college when his work shift changes every two weeks. We must be able to describe the benefits to a forty year old mother of three who has always wanted to attend college but feared the competition from the eighteen year olds. There must also be a measure of convenience for the person who has been an accountant for ten years and now seeks a degree in business when that person needs only one or two accounting modules to repair deficiencies in his own background.

The other side of accountability has to do with the use of faculty time. Faculty are tutors, writers, counselors, motivators and friends. There must be flexibility in the mixing of these duties to recognize the strengths of different faculty. The translation of research findings in one's own discipline into exciting learning modules is one of the highest forms of scholarship and must be regarded as equivalent to "pure" scholarship and research.

Although we have been able to start our college using this new approach, we know there are strategies for insinuating modular instruction into a traditional curriculum setting. Where we cannot expect that the majority of our community colleges and four-year institutions can stop their operation and restructure their curriculum, we believe that they can bring about a quiet revolution within the confines of the existing system.